SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05501J

MISCELLANEOUS METAL

02/05

-- End of Section Table of Contents --

SECTION 05501J

MISCELLANEOUS METAL
02/05

****
NOTE: This guide specification covers the requirements for miscellaneous metalwork for general building construction which is not part of Structural Steel or Metal Deck.
****

PART 1 GENERAL

This section is provided for the repair and/or replacement of miscellaneous metal associated with this painting project.

1.1 DESCRIPTION

Ladders, Balconies, Catwalks and Railing: Repair and renovations shall be performed as indicated on drawings, or as discovered during the work to be in an unsafe condition.

1.2 QUALITY ASSURANCE

Design Criteria: AWWA D100 and AISI(1992)

Qualifications of Suppliers and Personnel:

a. Steel Fabricator: Not less than 5 years continuous experience in the fabrication of structural steel.
b. Steel Erector: Not less than 5 years continous experience in the erection of tanks or similar structure.
c. Welding: All welding shall be performed by welders who are currently qualified by tests as prescribed in AWS D1.1/D1.1M
d. Use experienced riggers to erect steel. Carefully plan and lay out work so that a minimum of cutting and removal of undamaged material will be necessary.
e. The Superintendant shall have at least three(3) years experience in metal fabrication.

1.3 PRODUCT HANDLING

Store steel to be incorporated into this project above ground on platforms, skids or other approved supports.

Protect steel from corrosion.

Store welding electrodes in accordance with AWS D1.4

1.4 REFERENCES

****
NOTE: The following references should not be

manually edited except to a12 new references. References not used in the text will automatically be deleted from this section of the project specification.

****

The publications listed below form a part of this section to the extent referenced:

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A 14.3	LADDERS - FIXED - SAFETY REQUIREMENTS (SUPERSEDING ANSI-A14.3-1992)

AMERICAN WATER WORKS ASSOCIATION(AWWA)

AWWA D100	(1996) Welded Steel Tanks for Water Storage

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4	(1998) Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS D1.1/D1.1M	(2004) Structural Welding Code - Steel
AWS D1.4	(1998) Structural Welding Code - Reinforcing Steel

ASTM INTERNATIONAL (ASTM)

ASTM A 242/A 242M	(2001) High-Strength Low-Alloy Structural Steel
ASTM A 283/A 283M	(2000) Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A 307	(2003) Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
ASTM A 325	(2002) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A 36/A 36M	(2003a) Standard Specification for Carbon Structural Steel
ASTM A 490	(2002) Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
ASTM A 563	(2000) Carbon and Alloy Steel Nuts
ASTM A 588	(1992) High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 in. (100 mm) Thick
ASTM F 436	(1993; R 2000) Hardened Steel Washers

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 10	(2000) Near-White Blast Cleaning
SSPC SP 6	(2000) Commercial Blast Cleaning

1.5 SUBMITTALS

****
NOTE: Review submittal description (SD) definitions in Section 01300, "Submittals," and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.
****

The following shall be submitted in accordance with Section 01330, "Submittals," in sufficient detail to show full compliance with the specification:

SD-02 Shop Drawings

Submit detailed fabrication and erection drawings, signed and sealed by a registered structural engineer. Indicate all dimensions, method of assembly, connections and bill of materials.

Indicate all shop and field welds by AWS A2.4.

SD-03 Product Data

Manufacturer's catalog cut sheets for each product, including section or other type details.

Manufacturer's printed instructions.

SD-11 Closeout Submittals

Record Drawings

Upon completion of project, provide Owner with warranty for manufacturered items.

PART 2 PRODUCTS

2.1 MATERIALS

Prior to commencement of the work, submit the following to the Engineer of Record for review and approval:

Shop Drawings including, but not limited to:
fabrication
erection drawings

Product Data
Manufacturer's catalog cut sheets for each product, including section or other type details.

Manufacturer's printed instructions.

Indicate all shop and erection dimensions and details, including cuts, copes, connections, holes, threaded fasteners and welds.Indicate all shop and field welds by AWS A2.4.

All materials shall be new and shall be in conformance with the specified Codes and Standards.

Fabrication shall be done by manufacturer's who are regularly engaged in the manufacture of the type of work herein specified.

Structural steel shapes, plates and bars shall be ASTM A 36/A 36M(36 ksi). Steel plates for the tank repair shall conform to ASTM A 283/A 283M, Grade C.

Steel bolts and mechanical fasteners for water storage facilities per ASTM A 242/A 242M-89 and ASTM A 588-88.

Machine bolts shall conform with ASTM A 307.

Fasteners shall be complete with bolts, nuts and washers. Structural bolts shall conform with ASTM A 325, type 3 or ASTM A 490, type 3. Washers shall conform to ASTM F 436 and nuts shall conform to ASTM A 563, Grade C. Cap screws shall conform to ASTM A 325.

Ladders shall be fabricated using standard structural shapes conforming to ASTM A 36/A 36M and shall accommodate safety climb devices. Ladder rungs shall be fabricated from deformed steel re-bar for traction. The safety rails, attachments, accessories, mounts and dismounts shall be stainless steel, type 304 or 316. The dismounts for each ladder shall be as recommended by the safety rail manufacturer for the application and approved by the Contracting Officer. Ladder gate climb preventive shield shall be 8 feet high heavy gage aluminum, including all hardware and padlock and two sets of keys. Ladder gate climb preventative shield, safety harness, safety belts, safety rail system, and safety climb accessories shall be as manufactured by "SAF-T-CLIMB FALL PREVENTION SYSTEM" or approved equal. Contractor shall provide safety instructions and climb accessories as recommended by the manufacturer, ANSI A 14.3 an applicable OSHA requirements.

Welding Electrodes: Mild steel-covered arc welding electrodes for A36 steels: AWS D1.1/D1.1M, E70XX Series, low hydrogen, having a minimum yield point of 60,000 psi.

PART 3 EXECUTION

3.1 PREPARATION

Repairs and renovations shall be accomplished prior to abrasive blasting and painting.

All work shall be accomplished by skilled workmen in a workmanlike manner. All welders shall hold current AWS Certification and shall submit all credentials to the Contracting Officer prior to starting work. All welding will be subject to testing and inspection in accordance with Section 11 of AWWA D100.

Structural components to be replaced shall be shop fabricated to fit the

existing length of member to be replaced. Upon completion of the fabrication, they shall receive shop coat per Part 3.4 herein and per SGS sections 09920, 09950 and 09951. Immediately upon removal of the existing member the replacement member shall be installed and bolts shall be placed and tightened.

Structural steel replacement operations on water towers and the communication tower shall be performed under the supervision on the independant inspector. Repair on the tower columns (legs) shall be limited to installing patch plates, if required. The columns shall not be cut or disassembled at any time. Replacement of components shall not be performed under inclement weather conditions or when the wind speeds are over 20 miles per hour. The independant inspector shall establish and approve the appropiate weather conditions to ensure safe working conditions. The inspector's daily log shall include the weather conditions. The Contractor shall be responsible for providing all temporary bracing on the water towers and communication towers, as approved in writing by the independant inspector to ensure worker and structural safety in not jeopardized. See drawings for specific items on water towers to be replaced.

Caution: It will be the Contractor's responsibility to thoroughly examine and qualify all rods and attachments on the towers and tank support stands for structural integrity and any and all those loads which the Contractor may impose.

3.2 FABRICATION

Workmanship: In addition to requirements set forth herein, the Contractor shall conform to AISI "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings".

Cleaning and Straightening: Thoroughly clean and straighten materials before fabrication. After working component parts, remove twists and bends before assembly.

Tolerances: Do not exceed tolerances set forth in AISC Code of Standard Practices.

Shop Practice: Because of shop practice or availability of stock, the Contractor may offer substitute shapes, which the Government may approve, provided properties are equivalent and aesthetics are not adversely affected. The Contractor shall provide registered engineer's certificate of substitutions equality.

Field measurements: Take measurements as required to supplement and verify drawings dimensions, and to be responsible for accuracy.

3.3 WELDING

All welding shall be performed in accordance with AWWA D100 and in accordance with requirements of AWS D1.1/D1.1M or as detailed and noted on drawings.

All welding and surface preparation(blasting) operations shall be complete prior to starting any painting/coating and/or disinfection operations.

Storage and care of electrodes: At time of use, verify that coatings on low-hydrogen type electrodes are thoroughly dry.

Use electrodes taken from hermetically sealed packages within 4 hours of the time the package is opened.

Use one of the following methods for drying or reconditioning electrodes that have not been used within the 4-hour period, or electrodes that have been exposed more than 1 hour to air having a relative humidity of 75% or more.

a. Dry for a minimum of 2 hours at a temperature between 300° and 400° F.
b. Store for 24 hours at a temperature of 200° to 250° F.
c. Recondition in accordance with the manufacturer's recommendations.

Immediately remove from job all electrodes of any classification that have been wet.

Preparation: Thoroughly clean surfaces to be welded of paint, scale and all foreign matter. Clean welds each time the electrode is changed. Chip entire area of hand guided and controlled flame-cut edges before welds are deposited theron.

Characteristics of welds: After depositing welds, brush with wire brushes and verify that welds exhibit section, smoothness of weld metal, feathered edges without undercuts or overlaps, and freedom form porosity clinkers. Use only AWS pre-qualified weld details. Visually inspect edges and ends of fillet welds to verify good fusion and penetration into base metal.

Verify that all butt and tee welds indicated are full penetration.

During assembly and welding, maintain component parts of built-up member in close contact.

During welding, take precautions to minimize "lock-up" stress and distortion due to heat.

Do not weld in a windy location until adequate wind protection has been provided.

3.4 SHOP COATING

Surface preparation and coating:

Water Towers:

a. The exterior structural components that are to be replaced may be shop fabricated and surfaces shall be abrasive blasted to a minimum preparation of Commerical Blast Cleaning, SSPC SP 6, prior to coating application.

b. Interior and/or submerged surfaces of the structural components shall be abrasive blast cleaned to a minimum of Near White Blast Cleaning, SSPC SP 10.

c. Primer: Apply one coat fo the specified primer for the surface exposure as indicated in SGS sections 09920, 09950 and 09951.

d. Coatings: The coatings for the interior and exterior components shall be in accordance with SGS sections 09920, 09950 and 09951.

Communication Towers:

a. The components that are to be replaced shall be tagged and actual member size shall be verified and measurements shall be taken for shop fabrication.

b. Upon completion of the fabrication, the components shall be blast cleaned in accordance with SSPC SP 6, "Commercial Blast Cleaning", prior to coating application.

c. Coatings: The coatings for the replacement components shall be per SGS sections 09920, 09950 and 09951.

d. Field touch up: After removing the existing fasteners, the end connections and overlapping areas shall be hand cleaned to remove all the rust, and the areas shall be coated with paint specified in SGS sectionS 09920, 09950 and 09951.

3.5 REPAIRS/RENOVATIONS

As indicated on the drawings, specifically directed by the Contracting Officer or as discovered during the work to be in an unsafe condition.

3.6 CLEANING AND REPAIRING

Clean work under provision of SGS sections 01110 and 09920.

Clean adjacent soiled surfaces.

Repair or replace defaced or disfigured finishes caused by work per SGS sections 09950 and 09951.

3.7 PROTECTION OF FINISHED WORK

Protect finished installation under provision of SGS sections 09900, 09950 and 09951.

All adjoining metal surfaces shall be sealed with caulk to insure that no hidden voids are exposed to the environment and susceptible to corrosion.

3.8 PROJECT CLOSEOUT

Two weeks prior to final inspection and project closeout, Subcontractor must submit the following to th Engineer of Record:

Record Drawings
warranty for manufacturered items.

-- End of Section --